



## 3-Flute Extra High Performance, Variable Helix Endmills

- RedLine XHP Variable Helix 3-Flute tools are designed for fast metal removal. We control vibration and chatter through a unique dampening geometry and can handle faster speeds and feeds generated by the application of our AlCrN coating.
- Designed to run in a wide range of materials from cast irons and steels to titanium and high temperature alloys.
- These Extra High Performance tools can be found on pages 33-40.



### XHP Variable Helix 3-Flute Tools Speeds & Feeds

Material	Grades	Cut Type	Axial DOC	Radial DOC	SFM	Feed by Endmill Diameter (IPT)					
						AlCrN	1/32 (.0312)	1/16 (.0625)	3/32 (.0937)	1/8 (.1250)	3/16 (.1875)
<b>P - Steels</b>											
High Strength Tool Steel	A2, D2, P20, H11, H13, S2, 01	High Speed	1 x D	.1 x D	390	.0002	.0002	.0002	.0003	.0004	.0005
		Copy Milling	1 x D	.1 x D	390	.0001	.0002	.0002	.0002	.0003	.0004
Low Carbon	A36, 12L14, 12L15, 1005, 1018, 1020, 1108-1119, 1213-1215, 1513-1518, 4012, 5015, 9310	High Speed	1 x D	.1 x D	655	.0002	.0002	.0002	.0003	.0004	.0005
		Copy Milling	1 x D	.1 x D	655	.0001	.0002	.0002	.0002	.0003	.0004
Medium Carbon	1040-1095, 1140-1151, 1330-1345, 1520-1572, 4023-4063, 4120-4161, 4330-4340, 4620-4640, 8620-8660, 8740-8750, 6150, 51000, 52100	High Speed	1 x D	.1 x D	655	.0002	.0002	.0002	.0003	.0004	.0005
		Copy Milling	1 x D	.1 x D	655	.0001	.0002	.0002	.0002	.0003	.0004
<b>M - Stainless Steels</b>											
Austenitic	301-304L, 310, 316L, 321, 347	High Speed	1 x D	.1 x D	325	.0002	.0002	.0002	.0003	.0004	.0005
		Copy Milling	1 x D	.1 x D	325	.0001	.0002	.0002	.0002	.0003	.0004
Martensitic	403, 410, 416, 420, 430, 431, 440	High Speed	1 x D	.1 x D	325	.0002	.0002	.0002	.0003	.0004	.0005
		Copy Milling	1 x D	.1 x D	325	.0001	.0002	.0002	.0002	.0003	.0004
Precipitation Hardening	12/8, 15/5, 17/4, AM-50/355/363, PH13-8MO, PH14-8/MO	High Speed	1 x D	.1 x D	325	.0002	.0002	.0002	.0003	.0004	.0005
		Copy Milling	1 x D	.1 x D	325	.0001	.0002	.0002	.0002	.0003	.0004
<b>K - Cast Irons</b>											
Ductile	A536, J434, 60-40-18	High Speed	1 x D	.1 x D	655	.0002	.0002	.0002	.0003	.0004	.0005
		Copy Milling	1 x D	.1 x D	655	.0001	.0002	.0002	.0002	.0003	.0004
Gray	A48, A436, A319, Class 20, G4000	High Speed	1 x D	.1 x D	655	.0002	.0002	.0002	.0003	.0004	.0005
		Copy Milling	1 x D	.1 x D	655	.0001	.0002	.0002	.0002	.0003	.0004
Malleable	A220, A602, J158	High Speed	1 x D	.1 x D	655	.0002	.0002	.0002	.0003	.0004	.0005
		Copy Milling	1 x D	.1 x D	655	.0001	.0002	.0002	.0002	.0003	.0004
<b>N - Non-Ferrous</b>											
Aluminum Alloys	2014, 2024, 6061, 7075	High Speed	1 x D	.1 x D	985	.0002	.0002	.0002	.0003	.0004	.0005
		Copy Milling	1 x D	.1 x D	985	.0001	.0002	.0002	.0002	.0003	.0004
Aluminum High Silicon	A380, A390	High Speed	1 x D	.1 x D	985	.0002	.0002	.0002	.0003	.0004	.0005
		Copy Milling	1 x D	.1 x D	985	.0001	.0002	.0002	.0002	.0003	.0004
Brass/Bronze	Aluminum Bronze, Low Silicon Bronze	High Speed	1 x D	.1 x D	400	.0002	.0002	.0002	.0003	.0004	.0005
		Copy Milling	1 x D	.1 x D	400	.0001	.0002	.0002	.0002	.0003	.0004
Composites	G-10, Fiberglass, Graphite, Graphite Epoxy, Plastics	High Speed	1 x D	.1 x D	390	.0002	.0002	.0002	.0003	.0004	.0005
		Copy Milling	1 x D	.1 x D	390	.0001	.0002	.0002	.0002	.0003	.0004
Copper		High Speed	1 x D	.1 x D	400	.0002	.0002	.0002	.0003	.0004	.0005
		Copy Milling	1 x D	.1 x D	400	.0001	.0002	.0002	.0002	.0003	.0004
Magnesium		High Speed	1 x D	.1 x D	800	.0002	.0002	.0002	.0003	.0004	.0005
		Copy Milling	1 x D	.1 x D	800	.0001	.0002	.0002	.0002	.0003	.0004
<b>S - High Temp Alloys</b>											
Cobalt Base	Stellite, HS-21, Haynes 25/188, X40, L605	High Speed	1 x D	.1 x D	260	.0002	.0002	.0002	.0003	.0004	.0005
		Copy Milling	1 x D	.1 x D	260	.0001	.0002	.0002	.0002	.0003	.0004
Iron Base	Incoloy 800-802, Multimet N-155 Timkin 16-25-6, Carpenter 22-b3	High Speed	1 x D	.1 x D	260	.0002	.0002	.0002	.0003	.0004	.0005
		Copy Milling	1 x D	.1 x D	260	.0001	.0002	.0002	.0002	.0003	.0004
Nickel Base	Inconel 625/718, Inco 700, 713C, 718, Monel 400-401, 404, K401, Rene, Rene 41 & 95 Hastelloy, Waspoly, Udimet 500 & 700	High Speed	1 x D	.1 x D	195	.0002	.0002	.0002	.0003	.0004	.0005
		Copy Milling	1 x D	.1 x D	195	.0001	.0002	.0002	.0002	.0003	.0004
Titanium	Commercially Pure, 6Al-4V, ASTM 1/2/3, 6Al-25N-4Zr-2Mo-Si, Ti-8Al-1Mo, Ti-8Al-4Mo	High Speed	1 x D	.1 x D	260	.0002	.0002	.0002	.0003	.0004	.0005
		Copy Milling	1 x D	.1 x D	260	.0001	.0002	.0002	.0002	.0003	.0004